USAF MRCI Requirements Overview

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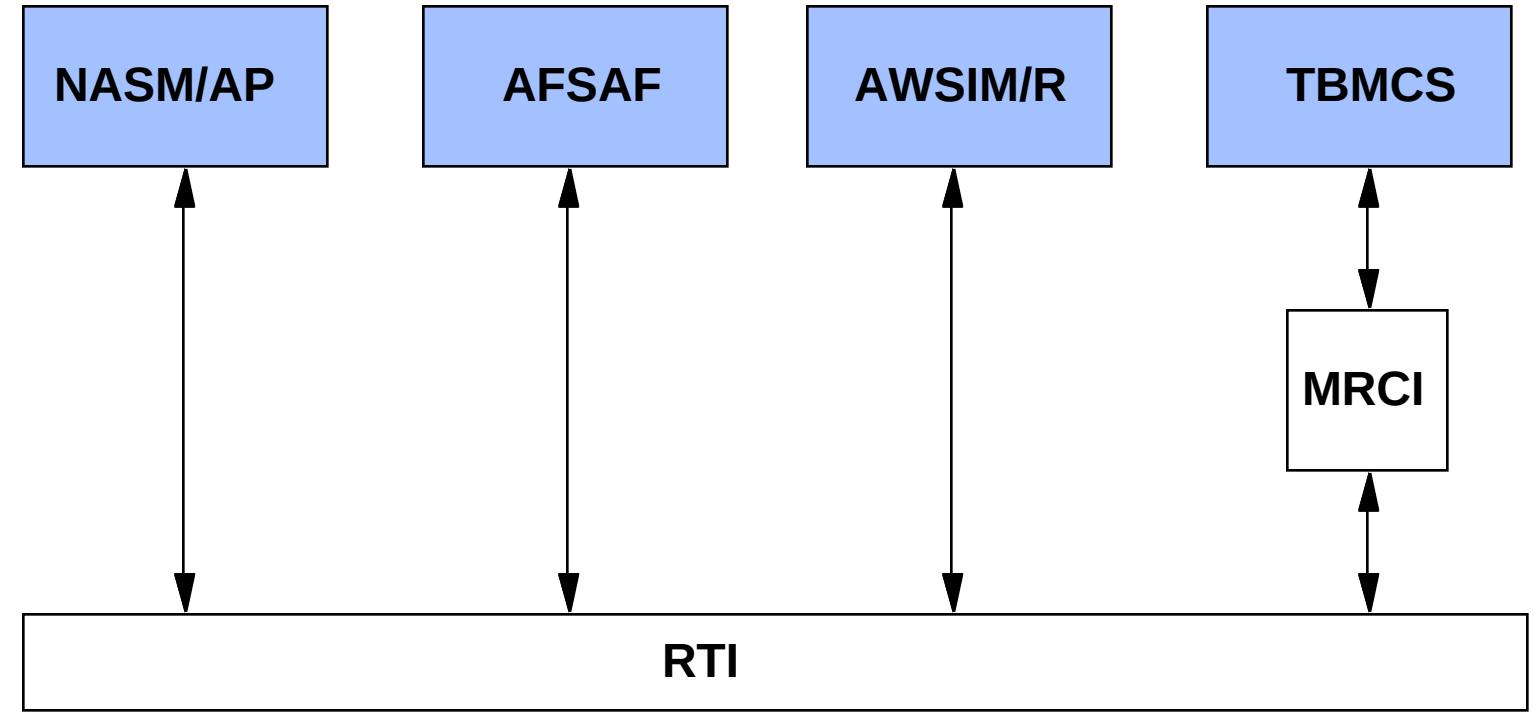
ESC/AV Relationship to MRCI



= ESC/AV Currently
Acquisition Authority/ Systems Engineer

Strategic Requirements

- **The MRCI shall be an experiment to develop a set of technical tools to support a sufficiently transparent interface between C4I systems and simulations.**
- **The MRCI effort shall result in a set of reusable modules which will allow other related or similar real-world systems to interface with minimal additional effort.**
- **Although the experiment will provide for modifications to the actual models, the MRCI experiment will focus on the C4I system side of the interface.**
- **For the current MRCI activity, the effort shall focus on:**
  - **“compliance with the HLA,”**
  - **“C4I information exchange,”**
  - **“ground truth exchange.”**

Strategic Requirements (cont.)

- **The MRCI shall provide a language for specification of formats, timing, and conversion requirements of data interchange, and associated tools for rapid input and maintenance of interface specifications.**
- **The MRCI Experiment shall follow the HLA (Rules), and therefore, to have value for future simulation development, shall not be in any way be restricted by:**
  - **the use of legacy simulation to real-world interface solutions (e.g., Project Real Warrior (PRW)),**
  - **use of alternate redundant mechanisms to the RTI (e.g., GIAC Data System (GDS)), or**
  - **the introduction of additional layers of complexity to the simulation interface (e.g., Joint Training Confederation (JTC) ALSP to RTI adapter)**

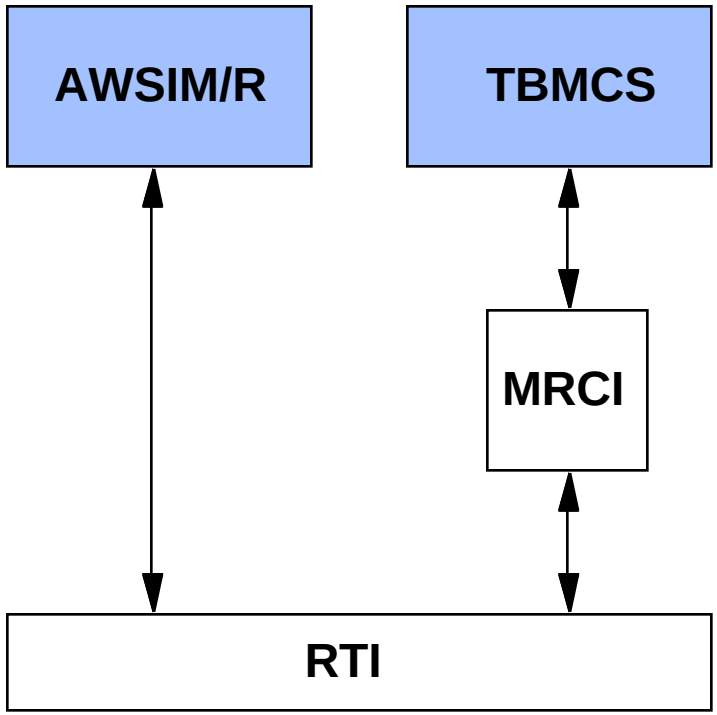
Architecture

- **The architecture for the MRCI components shall be organized as a topology structured around three distinct layers, isolating the physical system translation layer for each external system instance to afford maximum reuse between the applications programming interface (API) and the system specific layer(s):**
  - **a system specific interface;**
  - **a set of generic, *reusable* modules; and**
  - **an RTI services interface.**
- **Standard Object Model Template for data interchange & transformation of objects and their attributes;**
- **Interfaces to all models shall be developed as an integral part of the model.**
  - **On the simulation side, the MRCI project shall not use add-on pieces of software that are outside of the model itself.**

Systems Characteristics

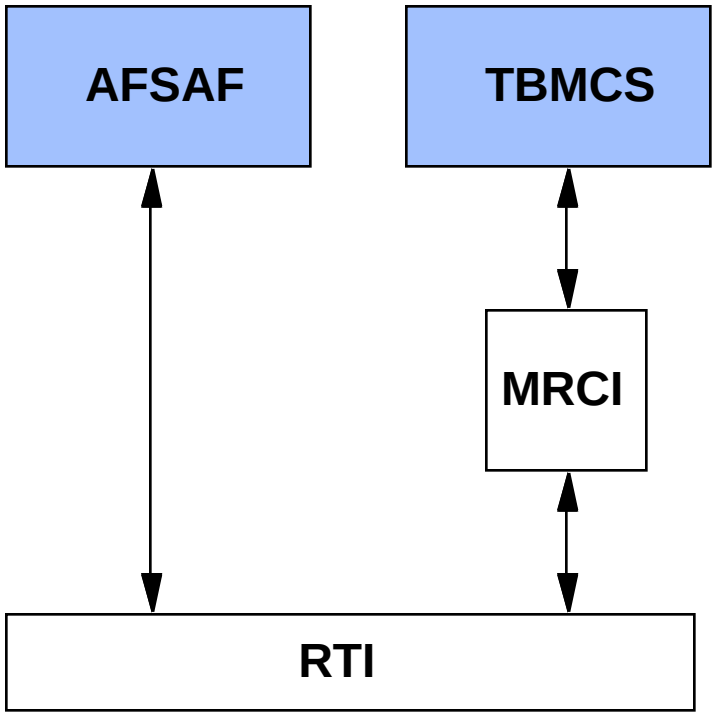
- **Reduce the number of, and special training required for, system administrators, network administrators, and other exercise support personnel**
- **Minimize life-cycle costs, and be logistically supportable**
- **Use well-defined application program interfaces (APIs) between the layers and the support services,**
- **Be flexible, extensible, and evolvable to capitalize on current and emerging industry accepted standards and commercially available products**
  - **Use COTS, GOTS, and NDI to the maximum extent feasible.**
- **Provide sufficient flexibility and performance to support changes and extensions to the interfaces**
- **Optimize the interdependencies between software components so that the impact of change is localized**

AWSIM/R to TBMCS



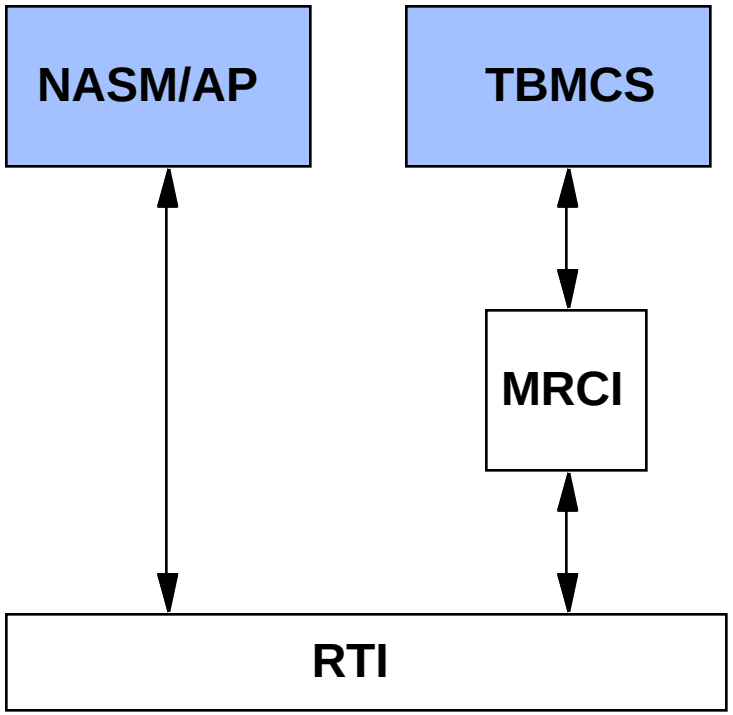
- **Interface the Re-engineered Air Warfare Simulation (AWSIM/R) to Theater Battle Management Core Systems (TBMCS). This activity will include:**
  - **all the capability of the current Project Real Warrior (PRW) and CTAPS Wargaming Interface Controller(CWIC)**
  - **APS DBMS and simulation database reconciliation**
  - **show the full range of planning through execution, through BDA, to replanning**

AFSAF to TBMCS



- **Interface the Air Force Semi-Automated Forces (AFSAF) to Theater Battle Management Core Systems (TBMCS). This activity will include:**
  - **the parsing and transmission of ATO/ACO orders for virtual mission planning & execution to be performed within the AFSAF side of the interface**
  - **will use the STOW SEID Simulation Infrastructure (SI)and OpenSAF as available**

NASM/AP to TBMCS



- **Interface National Air & Space [Warfare] Model Advanced Prototype (NASM/AP) to the Theater Battle Management Core Systems (TBMCS). This activity will:**
  - **show how the MRCI can be used in "newly developed/next generation" simulations**
  - **leverage the JTFp FOM and leverage the HLA experiment activity**

Data & Information Requirements

- **Data Requirements**
  - **Command and Control messages, as transmitted by the RTI, shall leverage de facto standards such as the ongoing Command Control Simulation Information Language (CCSIL)**
- **Information Requirements**
  - **Reconcile the differences between the simulations and real-world systems before exercise using other than RTI mechanisms.**
  - **Content interchange shall:**
    - **require the use of direct database transfers to and from TBMCS as accommodated by the forthcoming version of TBMCS and or**
    - **interface to TBMCS through the existing system's normal means of communication, (e.g., US Message Text Format (USMTF) messages)**

Command & Control Requirements

- **Interface transparent to and not levy additional requirements on the C4I system.**
- **Separate of ground & perceived truth**
- **State of messages will be maintained on the RTI.**
- **Content (e.g., video stream to be acted on) may be off RTI.**

Communications Requirements

- **Provide the capability of receiving, generating, and transmitting TADIL A, B, and J messages.**
- **Communications to the simulations shall be logically through the RTI software in accordance with a to be developed FOM.**
  - **Non-state data (e.g., video streams, pre-exercise database reconciliation, etc.) may use other mechanisms.**
- **A notional SOM from which it contributes to the FOM of the Federation that it is participating in.**
  - **use existing FOMs to maximize interoperability with other prototypes, protofederations, and experiments.**
- **Demonstrate the ability to interface TBMCS to NASM/AP via the RTI using the JTFp FOM**

Additional Outyear C4I System Interfaces

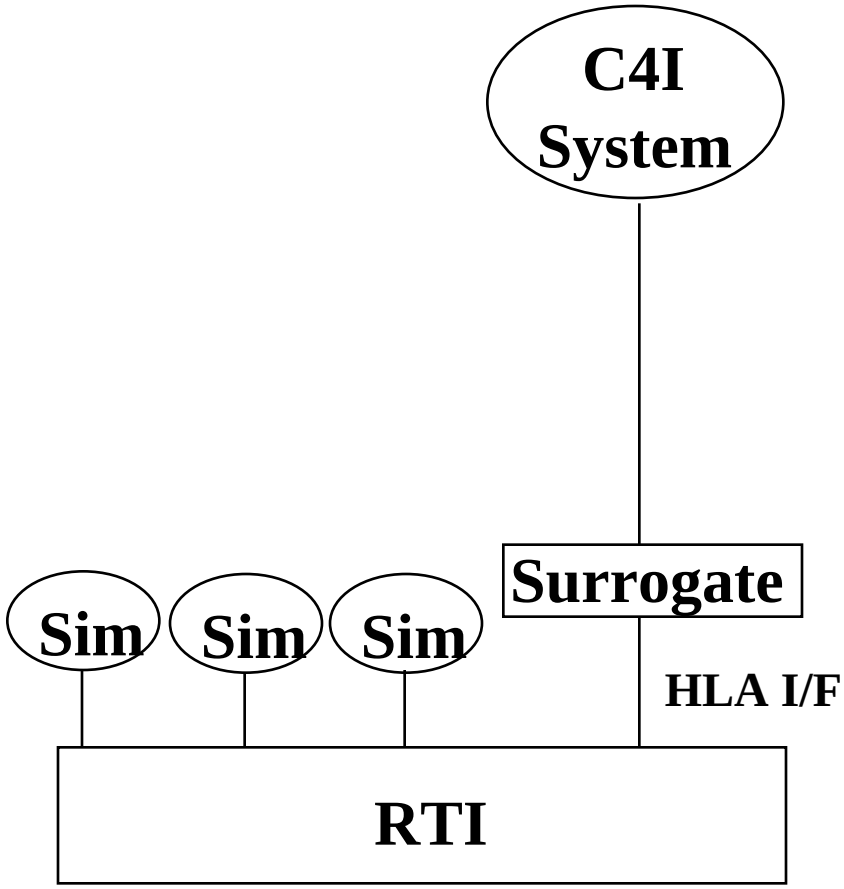
- **CIS and WCCS subsystem interfaces of TBMCS**
- **AFMSS as an MRCI interface system to investigate issues or provide capabilities regarding route planning**
- **Command Control Information Processing System (C2IPS)**
- **Joint Deployable Intelligence Support System (JDISS)**
- **Special Operations Forces Planning and Rehearsal System (SOFPARS)**
- **Tactical Information Broadcast System (TIBS)**
- **Tactical Receive Equipment (TRE) and Related Applications (TRAP)**
- **others**

Additional Outyear C4I System Activities

- **Outyear MRCI activities shall focus on the following live player functions:**
  - **"management of communications with live platforms," and**
  - **"representation during periods of lost communications."**
- **Incorporate additional JTC actors, such as RESA in the out years.**
- **Incorporate additional JTFp members to the NASM/AP to TBMCS federation. These simulations include NSS for the Navy and Eagle for the Army.**
- **Incorporate JSIMS component simulation systems (e.g., JSIMS Core, WARSIM 2000, NASM, USN component).**

Backups

Simulation <--> C4I Functionality



- **C4I information exchange**
  - **Live system sends orders, reports, data etc. to simulated command nodes/systems**
  - **Simulated systems or command nodes send orders, reports, data to live systems**
- **Ground truth exchange**
  - **Simulated systems interact with (shoot, collide, jam) live systems**
  - **Live systems must send ground truth updates in accordance with FOM so simulation can project live system into simulated world***
- **Compliance with HLA I/F**
  - **Appropriate use of RTI services***

*** Artificialities due to simulation interface**

Simulation <--> C4I Functionality